The Report

of the Dissertation Council on Information and Telecommunication Technologies at Kazakh National Research Technical University named after K.I. Satbayev to awarding the degree of Doctor of Philosophy(PhD), doctor of profile in the next group of specialties: 6D070300 Information Systems (by industry), 8D06103 - Management Information Systems, 6D070400 Computer and Software Engineering, 8D06101 - Software Engineering, 8D06102 - Machine Learning & Data Science, 8D06104 – Cybernetics and Artificial Intelligence, 6D100200 Information Security Systems, 8D06105 - Information security systems, 6D071900 Radio engineering, electronics and telecommunications, 8D06201 - Telecommunications, 6D070200 Automation and control, 8D07101 - Automation and robotization for 2024

1.2 The number of hold meetings

The Dissertation Council has hold 4 (four) meetings during the report period.

2.2 Names of council members who attended less than half of the meetings

- no

3.2 List of doctoral students with an indication of the organization

№	Full name of student	Name of University
1	Assanov Ilyas Bolatovich	Kazakh National Research Technical University named after K.I. Satbayev
2	Ybytayeva Galiya Seitkalievna	Kazakh National Research Technical University named after K.I. Satbayev
3	Mussilimov Kuanysh Bakytuly	Kazakh National Research Technical University named after K.I. Satbayev
4	Sabibolda Akezhan Muratuly	Kazakh National Research Technical University named after K.I. Satbayev

4.2 The brief analysis of dissertations that have been considering by the Council during the reporting year

The Dissertation Council considered 4 (four) theses on 1 (one) specialties and 3 (three) educational program in the reporting year. The names of dissertations by specialization are given below:

№	Full name	Thesis name	Code and name of the specialty

1	Assanov Ilyas Bolatovich	Development of a flight planning model for technically heterogeneous UAVs to solve precision farming problems	8D6102 – «Machine Learning & Data Science»
2	Ybytayeva Galiya Seitkalievna	Development of an information and analytical system for monitoring illegal text information based on an ontological approach	8D06103 – "Management information systems"
3	Mussilimov Kuanysh Bakytuly	Development of an intelligent diagnostic system and optimal control of the wind power complex	6D070200 - Automation and Control
4	Sabibolda Akezhan Muratuly	Research and development of spectral-correlation methods for delay estimation and direction finding of radio signals	8D06201 – Telecommunications

4.2.1 Analysis of the topics of the considered theses

4.2.1.1 Analysis of the topics of the thesis of Assanov Ilyas Bolatovich on the topic "Development of a flight planning model for technically heterogeneous UAVs to solve precision farming problems" in the specialty 8D6102 – «Machine Learning & Data Science».

The purpose of the work. To develop a flight planning model for multiple heterogeneous UAVs in precision agriculture using a ground mobile platform.

Scientific novelty of the dissertation.

1) A flight planning model is proposed that takes into account: 1. Parameters of the heterogeneous UAV fleet, from which a group of UAVs can be selected to solve the overflight problem; 2. Availability of a ground mobile platform for refueling and collection of UAVs after the mission; 3. Labor of the personnel performing the overflight; 4. Costs associated with equipment wear and tear; 5. Penalty for extended (exceeding the threshold) flight time. 2) A new method for solving the coverage problem using a mobile ground station for UAV control and intermediate maintenance is proposed. 3) A model that takes into account the complex price of overflight is developed. Under the conditions of computational experiments, the proposed model allowed (depending on the size and shape of the field) to minimize the complex cost of overflight from 10 to 30%.

4.2.1.2 Analysis of the topics of the thesis of Ybytayeva Galiya Seitkalievna on the topic "Development of an information and analytical system for monitoring illegal text information based on an ontological approach" submitted for the degree of Doctor of Philosophy (PhD) in the educational program "8D06103 – Management information systems".

The purpose of the work. Develop an information model of the automatic identification system of illegal texts of the Kazakh and Russian languages in Internet networks.

Scientific novelty of the dissertation. Corpus of criminally colored multilingual Internet texts and tools for automatic semantic markup of corpus of criminally colored texts based on an ontological approach have been developed. A multilingual terminological thesaurus, an ontology "Illegal Internet content" and an information model have been created. An information and analytical system for monitoring illegal textual information based on an ontological approach has been developed.

4.2.1.3 Analysis of the topics of the thesis of Mussilimov Kuanysh Bakytuly on the topic «Development of an intelligent diagnostic system and optimal control of the wind power complex» submitted for the degree of Doctor of Philosophy (PhD) in the educational program 6D070200 - Automation and Control.

The purpose of the work. Development and improvement of a vertical axis wind turbine by developing and introducing additional units and mechanisms regulated by the intelligent control method.

Scientific novelty of the dissertation. The dissertation work offers new scientific and technical solutions. The problem of synthesizing an intelligent system of diagnostics and optimal control of a wind power complex has been solved, which contributes to science. A control system with neuro-regulators is developed, which allows adapting to changing wind conditions, improving the stability and efficiency of turbines. The implementation of MPPT algorithms improves plant reliability and performance by optimizing power coefficient (C_P). Diagnostics and control system prevents critical situations, accelerates emergency recovery, improves reliability, minimizes downtime and minimizes the risk of equipment damage. Stable power generation at different wind speeds ensures a uniform and predictable power supply, which is important for the integration of wind power into the grid.

4.2.1.4 Analysis of the topics of the thesis of Sabibolda Akezhan Muratuly on the topic: "Research and development of spectral-correlation methods for estimating the delay and direction finding of radio signals" on the educational program 8D06201 - "Telecommunications".

Purpose of the work. Study of spectral-correlation methods for estimating the delay and direction finding of radio signals by developing a mathematical software model.

The scientific novelty of the study lies in the development of a highly efficient digital spectral-correlation method for determining the delay and direction of radio signals in semi-active and passive systems. As a result:

- For the first time, a method has been proposed that provides an estimate of signal parameters in one iteration, which significantly increases the speed.
- Studies have been conducted that have shown high accuracy and resistance to interference in a complex electromagnetic environment.
- A software model has been developed and tested that can be used in radio monitoring systems to improve their efficiency.

4.2.2 Connection of the topics of dissertations with the directions of development of science, which are formed by the Higher Scientific and Technical Commission under the Government of the Republic of Kazakhstan in accordance with paragraph 3 of Article 18 of the Law "On Science" and (or) state programs.

4.2.2.1 The dissertation work of Ilyas Bolatovich Assanov was completed within the framework of the project of the Institute of Computer Science of the Ministry of Education and Science of the Republic of Kazakhstan (source of funding: Science Committee of the Ministry of Education and Science of the Republic of Kazakhstan): IRN: AP08856412, State Registration Number: 0120PK00298 "Development of intelligent models of data processing and flight planning for solving precision farming problems using UAVs" in 2020-2023.

4.2.2.2 The dissertation work of **Ybytayeva Galiya Seitkalievna** was carried out within the framework of the project on grant research of the MSHE of the Republic of Kazakhstan "Information model and software tools for automatic search and analysis of multilingual illegal web content based on an ontological approach" - AR09259309 (2021-2023) in the Institute of information and computational technologies SC of MSHE of RK.

The dissertation work corresponds to the priority direction of the development of science in the Republic of Kazakhstan: 4) information, communication and space technologies.

4.2.2.3 The practical significance of the dissertation work of Mussilimov Kuanysh Bakytuly corresponds to the priority directions of science development for 2024-2026, approved by the High Scientific and Technical Commission of the Republic of Kazakhstan:

1) «Ecology, Environment and Rational Nature Management»;

2) «Energy, advanced materials and transportation».

The dissertation fully complies with the strategic directions of science development and state policy of the Republic of Kazakhstan in the field of energy, sustainable development and carbon footprint reduction, as well as the international obligations of the country under the Carbon Neutrality Doctrine of Kazakhstan and the Paris Agreement.

4.2.2.4 The dissertation work of Sabibolda Akezhan Muratuly corresponds to the priority areas of scientific development for 2024-2026, approved by the Higher Scientific and Technical Commission of the Republic of Kazakhstan: "Advanced production, digital and space technologies" and the specialized scientific direction for 2024-2026: "Information and computing technologies".

4.2.3 Analysis of the level of implementation of the results of dissertations in practice.

4.2.3.1 The practical significance of the work of Ilyas Bolatovich Assanov is determined by the fact that the developed system represents a comprehensive solution to the problem of covering differently shaped fields using a mobile ground

station and a heterogeneous fleet of available UAVs, which makes it relevant for a wide range of consumers in the field of precision agriculture. This system allows to automate the process of flight route planning, making it an indispensable tool for modern agricultural enterprises№

4.2.3.2 The practical significance of the work of Ybytayeva Galiya Seitkalievna is the development of an information and analytical system for monitoring illegal text information based on the ontological approach. The information and analytical system includes the ontology of "Illegal Internet content", specialized text corpora, software tools for automatic semantic tagging of specialized corpora of criminally colored texts and an integrated technology for analyzing and monitoring illegal content in social networks and other Internet sources. The use of the developed system allows to increase the efficiency of law enforcement and special government organizations by increasing the likelihood of solving crimes and preventing illegal actions. The social effect of this study is to improve the legal and crime situation and improve the quality of life of society as a whole.

The practical significance of the work is also confirmed by the act of implementation in the Criminal Police Department of the Zhetysu Region.

4.2.3.3 The practical significance of the work of Mussilimov Kuanysh Bakytuly is determined by the fact that the intelligent control and diagnostic system developed in the framework of the study allows to significantly improve the reliability and efficiency of wind turbines, especially in harsh climatic conditions of the Zhungar Gate region. Implementation of the developed methods and models in industrial production will minimize downtime and risk of equipment damage, providing stable power generation at different wind speeds.

The practical significance of the work is also confirmed by the act of implementation at the production site of TELMZ LLP together with Future Power Solutions LLP.

4.2.3.4 The practical significance of the work of Sabibolda Akezhan Muratuly lies in the development and implementation of a new method of spectral-correlation analysis to improve the accuracy and speed of radio direction finding in complex electromagnetic conditions, which allows improving the operation of radio monitoring systems, in the creation and testing of a software model for digital processing of radio signals, which adapts to conditions with a low signal-to-noise ratio, which ensures the system's resistance to interference and increases the accuracy of determining radio navigation parameters, in the development of an experimental technique for determining the dynamic characteristics of signals and their impact on radio direction finding parameters, which allows more accurate assessment of measurement errors in real conditions.

5.2 Analysis of the work of reviewers (with examples of the most low-quality reviews)

Reviewers of dissertations of doctoral students for the degree of Doctor of Philosophy (PhD), were appointed persons in accordance with the requirements of the Standard Regulations on the dissertation Council.

Information about the appointed reviewers is provided below:

№	Full name	Reviewers	
1	Assanov Ilyas Bolatovich	Evgeny Nikulchev – Doctor of Technical Sciences, Professor of the Federal State Budgetary Scientific Institution of Higher Education "MIREA - Russian Technological University", Moscow, Russia.	Tamara Zhukabayeva – PhD, Associate Professor of the Department of Computer Science, Computer Engineering and Management, L.N. Gumilyov Eurasian National University, Astana, Kazakhstan.
2	Ybytayeva Galiya Seitkalievna	Rakhimova Diana Ramazanovna – PhD, Senior Lecturer at the Department of Information Systems of the Al-Farabi Kazakh National University, Almaty, Kazakhstan.	Bekmanova Gulmira Tyleuberdievna – PhD, Candidate of Technical Sciences, Associate Professor, Vice-Rector for Digitalization - Digital Officer, Member of the Board of the L. N. Gumilev Eurasian National University, Astana, Kazakhstan.
3	Mussilimov Kuanysh Bakytuly	Utepbergenov Irbulat Turemuratovich – Doctor of Technical Sciences, Professor of the Department of «Automation and Control», Almaty University of Power Engineering and Communications, Almaty, Kazakhstan.	Bakenov Kairat Asangalievich – Candidate of Technical Sciences, Director General, Kazakh Research Institute of Power Engineering named after academician Chokin, Almaty, Kazakhstan.
4	Sabibolda Akezhan Muratuly	Altay Zufarovich Aitmagambetov – Candidate of Technical Sciences, Academician of the International Academy of Communications, Professor, International University of Information Technology, Almaty, Kazakhstan.	Akhmet Kuanyshbayevich Saimbetov – PhD, Associate Professor, Al-Farabi Kazakh National University, Almaty, Kazakhstan.

In order to ensure compliance with the requirements of the Standard Regulations on the work of the Dissertation Council, each reviewer was sent a memo with the requirements for the content and design of the review of the dissertation work.

All the reviews were submitted on time and in accordance with the requirements of the Committee for control in education and science of MSHE of RK.

There are no negative reviews.

6.2 Proposals for further improvement of the system of training of scientific personnel

to ensure high-quality consideration of works at the seminars of the department.

7.2 The number of dissertations for the degree of Doctor of Philosophy (PhD), doctor by profile in the context of areas of training:

1) dissertations accepted for defense (including doctoral students from other universities) – 4;

2) dissertations withdrawn from consideration (including doctoral students from other universities) - 0;

3) dissertations for which negative reviews were received from reviewers (including doctoral students from other universities) - 0;

4) dissertations with a negative decision based on the results of the defense (including doctoral students from other universities) -0;

5) dissertations sent for revision (including doctoral students from other universities) - 0;

6) dissertations aimed at repeated defense (including doctoral students from other universities) - 0.

Chairman of the dissertation council on information and telecommunication technologies, doctor of tech. Sciences, Professor **R.K. Uskenbayeva**

Scientific Secretary of the dissertation council on information and telecommunication technologies, Ph.D. **Zh.B. Kalpeyeva**